

by the completion of his survey of Chilean pollen and spore types. He offers clear descriptions, a straight forward key and photomicrographs of good quality, in presenting the diagnostic information on all the significant pollen/spore types of the country.

This book will be essential for palynologists working in the tropical and subtropical Americas, of great interest to all palynologists and pertinent to students of Angiosperm taxonomy.

Dr. Heusser is to be congratulated on this notable contribution.

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Analysis of Temperate Forest Ecosystems

David E. Reichle (ed.). Springer-Verlag, New York. 1970. 304 p. \$14.50. Ecological Studies Series vol. 1.

Ecology's time has come, inevitably, universally and perhaps permanently. Unlike other disciplines of science, ecology's advent at the forefront of interest and importance was brought on largely by public awareness and general concern among scientists. There were no sparkling breakthroughs or discoveries by ecologists to propel the subject into prominence.

Contemporary writings reflect this uneasy status. In North America we are being deluged by books and pamphlets on the ecological crisis, many of them republishing the same articles with dreary regularity. Most take an excessively gloomy, emotional view of the future of the earth and few succeed in retaining the cool, analytical approach which both the discipline and the problems require.

However, while the environmental scientist-politicians are braying their opinions and prognostications about the eco-crisis from the rooftops, some equally concerned ecologists are getting on, quietly and effectively, with the important task of measuring the metabolism of the world's ecosystems. At present, this effort proceeds largely under the auspices of the International Biological Programme. This volume is an account of a workshop session of ecologists held in 1968

to discuss methods and theory pertaining to investigations of temperate deciduous forest ecosystems.

It provides both the professional biologist and the interested layman with a readable, provocative account of the intellectual and practical joys and difficulties of metering the flows of energy, nutrients and water through such a complex system as a forest. The eighteen chapters, of varied lengths and details, deal with Ecosystem Analysis (4), Primary Production (3), Consumer Organisms (3), Decomposers (2), Nutrient Cycles (3) and Hydrologic Cycles (3).

This collection of papers has launched the *Ecological Studies* series most effectively and those ecologists and others who watch the IBP from the sidelines will look forward with enthusiasm to subsequent volumes. One wonders if a cheaper format would have been more appropriate, reducing the price and bringing the book within the reach of the already over-stressed budgets of graduate students and young scientists.

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Geographical Variation in the Polar Bear, *Ursus maritimus* Phipps

By T. H. Manning. Canadian Wildlife Service, Report Series — No. 13, 27 p. \$1.00.

Of all the larger mammals, perhaps none has been subjected to such a confusing array of taxonomic treatments as have the bears. Earlier publications have used *Euarctos* for the black bears, *Thalarctos* for the polar bears, and *Ursus* for the grizzly and brown bears. The generic distinction between *Ursus* and *Euarctos* has been questioned, and most authors now regard them as congeneric. More recently some authors have concluded that *Thalarctos* as a distinct genus is untenable, thus placing all North American bears in the genus *Ursus*. As this concept has not yet been universally accepted, it is unfortunate that at least a short synopsis of the generic status of the polar bear was omitted from this paper.

Past taxonomic treatments have been seriously handicapped by small sample sizes and an in-

adequate knowledge of the normal variations that are related to sex and age. Manning attempts to overcome these problems by amassing as large a sample as possible (628 skulls), separating them into sex and age groups, and subjecting the cranial measurements to exhaustive statistical analysis. The total sample consisted of 240 adults, 106 sub-adults and 282 young. Of these only slightly more than half had the sex documented. When the specimens were grouped within five geographic regions, the largest samples of known sex were 31 males and 18 females from the Canada-west Greenland area (plus 34 presumed males and 17 presumed females). Unfortunately, the material was not extensive enough for any one population to establish meaningful trends in morphometric characters related to either sexual dimorphism or age, although data on these aspects are considered.

Manning used various statistical methods and tests in attempting to document geographical variation. The use of data from non-adults by adjusting their measurements to average adult length appears to be of questionable value. Moreover, it is highly doubtful that the summary of significant differences in Table 6 can be interpreted as a Duncan's multiple range test that would allow one to decide which of the populations are responsible for observed differences.

A minimum of conclusions is reached in spite of exhaustive statistical analysis. "Criteria previously used to distinguish races of *Ursus maritimus* were examined and found to be of no diagnostic value."

"A cline of increasing skull size from east Greenland westward to Bering Strait is demonstrated."

"The possible origin of the Alaska south population . . . is discussed . . .; it could be considered subspecifically distinct, but is left unnamed pending further investigation."

The regional differences in the size of adult bears is used by the author to postulate that there is no large-scale circumpolar movement and that some populations may be partially isolated by such factors as ancestral breeding and denning areas.

This work makes a much needed contribution to our understanding of morphological variation

in polar bears by providing a base for further study.

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Ecology and Physiology of Parasites: A Symposium

Edited by A. M. Fallis. University of Toronto Press, Toronto. 1971. 258 p., illus., \$15.00.

This book comprises the twelve papers presented at a symposium held at the University of Toronto in February 1970. The contributors, editor, and publishers are to be congratulated for producing this volume with so little delay. The book is well bound, printed on good quality, glossy paper, and the text is remarkably free from typographic errors. The articles are illustrated with approximately 140 line drawings, photographs, and electron micrographs.

The following topics are covered in comprehensive reviews of 18-36 pages: development and ecology of coccidia and related intracellular parasites (D. M. Hammond), epidemiology of the leishmanias (R. Lainson and J. J. Shaw), morphological and physiological considerations of extracellular blood protozoa (K. Vickerman), helminths as vectors of micro-organisms (D. L. Lee), site-finding behaviour in helminths (M. J. Ulmer), physiology and behaviour of *Entobdella soleae* (G. C. Kearn), and ecology and evolution of blood-sucking Diptera (J. A. Downes). Shorter review papers deal with the following: physiological, morphological and ecological considerations of some microsporidia and gregarines (J. Vavra), microcosm of intestinal helminths (C. P. Read), movement of nematodes (H. R. Wallace), ecology of onchocerciasis (B. O. L. Duke), and *Culex*-host-encephalitis complex (W. C. Reeves). Each paper is followed by the opening remarks of the discussion leader.

Although one objective of the organizers of this symposium was to "interest those in various biological disciplines and professions", this book seems destined to appeal primarily to those working in the fields of animal parasitology and tropical medicine. Most parasitologists will find something of direct application here, and will welcome



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